Grade Level/Course:
Grade 1

Lesson/Unit Plan Name:
Adding Multiples of 10

Rationale/Lesson Abstract:

Understanding Place Value
Students in 1st grade are developing their understanding of the number 10, its value, writing in base-10, and adding and subtracting amounts of ten. A variety of activities and lessons are needed to approach the topic from multiple viewpoints to help support students in deepening their understanding of 10 and place value. A student's ability to label the tens place and the ones place or to count by tens does not guarantee that students understand that one ten is the same as ten ones.
A variety of manipulatives and methods can support students in having a deeper understanding of place value.

This lesson specifically addresses adding amounts of ten to a number. A variety of methods are modeled in this lesson to demonstrate side-by-side comparison of models and understandings of adding amounts of ten. Methods include: Base-10 Blocks with or without a Place-Value chart, Drawing "Sticks" and "Dots", Ten-frame cards, Number Line, Place Value Chart, and Traditional.

Timeframe:
Multiple 60-minute sessions

Common Core Standard(s):

Grade 1:

Use place value understanding and properties of operations to add and subtract.

1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.6 Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Supporting Standards:

1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones—called a "ten."

b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Instructional Resources/Materials:

Base-Ten Blocks
Ten Frame Cards
Multiple Method Mats

Additional Materials

Counting items
Hundreds Chart
Number Line templates

Activity/Lesson:

Warm-Up/Number Routines for 1st Grade

Below are two different counting routines, (a) Counting Collections and (b) Can you find the link? These routines are provided as sample activities to do with students at the beginning of your lesson. Each routine is about 10 minutes. However, these are ***not meant to be done in the same lesson***, but two different warm-ups or number routines to be done over time of a few days or weeks. These routines can be done over and over again to help students gain proficiency in counting strategies, the value of a number, the meaning of place value and number sense.

Number Routine: Counting Collections

This routine can be done daily or a few times a week. Vary the amount of objects each time. You can begin with smaller amounts in the range of 20-40 items and gradually increase the amount of items. Lead a discussion about how the items can be counted, how to count them by ones, counting them by organizing in tens, and other suggestions from students. Also discuss which counting strategies are efficient and likely for fewest mistakes when counting.

As a class count various collections, make sure to emphasize:

- There are many ways to organize and count objects
- Some methods are more efficient than others
- Count both ways – "Count-By-Ones" and "Count-By-Tens" Discuss why you get the same result.

SAMPLE **Counting Collections**

Have students take a linker cube for each pocket that they have on their clothes. Some students may have 2 linker cubes; others may have 6 linker cubes. Here is a sample of a class conversation.

Teacher: "How can we add the total number of pockets (represented by our linker cubes)?"
Students: [by 1's, by 5's, by 2's, etc.]
Teacher: "Ok, let's count them by ones." Have the class count together by ones.
Teacher: "Now, let's count a different way. "
Lead the class through another way to count. Over time (maybe a few days), lead students to discover that adding in groups of 10 is really convenient and an efficient strategy.

EXTENSION: Once you have counted a collection, take 10 more of that same collection and add it to the collection. Ask students how many are there now? Lead students through a discussion of how many there are and how they know. You can add 2 groups of ten or 3 groups of ten and continue the same process. This will also work well if you subtract groups of ten and discuss how many and how you know.

Number Routine: Can you make the link?
This routine can be done daily or a few times a week. Vary the amount of objects each time. You can begin with smaller amounts in the range of 20-40 items and gradually increase the amount of items. Lead a discussion about how the items can be counted - how does organizing the objects in tens help us count? Also discuss which counting strategies are efficient and likely for fewest mistakes when counting.

As a class count various collections, make sure to emphasize:

- There are many ways to organize and count objects
- Some methods are more efficient than others
- Count both ways – "Count-By-Ones" and "Count-By-Tens" Discuss why you get the same result.

SAMPLE **Can you make a link?**

Have a group of links that is only partially linked in groups of 10. For example, have 3 sets of 10 links, and 12 more links. Make sure students understand that there are 10 chains in each link; count as necessary. Have students count the total number of links in all. Encourage students to count in whatever way they want. Record all the answers and discuss how students counted.

Next, change the groupings of links. For example, make a ten chain from the singles. Now, how may links are there? How can we count the links now? How did the grouping changed?

Additionally, change the groupings of links by taking some links chained together and making them singles. How can we count the links now? Now, how many links are there?

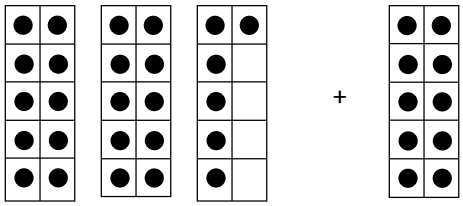
Activity/Lesson:
This lesson will explore using multiple methods for adding and subtracting tens to a number. To emphasize the value of ten, what it means to be in the tens place, how the place values change in relevance to the
Remember, there are certain foundation understandings for each method and advantages to using each model. Which methods you demonstrate side-by-side together will depend on the learning needs of your students. The Examples below are models of what might occur in the classroom.

Example 1a. Side-by-Side Comparison: Ten-Frames & Place Value (with Traditional)
24 + 10

Teacher: "Let's build 24. How can we build the number 24?"
Lead students through a discussion about how we can show the number 24 using the Ten-Frame Cards.

Teacher: "Ok. Now, let's add 10."
As you model the addition with the Ten-Frame cards, record what is happening in the Base-10 Chart.

Ten Frames



Place-Value Chart

Tens	Ones
2 + 1	4

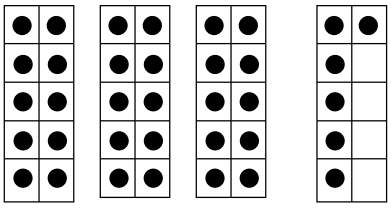
Traditional

24
+ 10

Teacher: "What do you notice about the Ten-Frame cards?"
Students might notice that you have four Ten-Frame cards that are tens – they each have ten dots on them and have a value of ten – if needed students might count them.

Teacher: "Can we group any of these cards together?"
We can organize the cards so that all the Ten-Frame cards that are "full" or have 10 are grouped together.

Ten Frames



Place-Value Chart

Tens	Ones
2 + 1	4
3	4

Traditional

24
+ 10
34

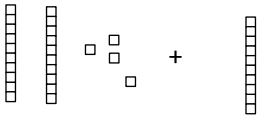
Counting all the dots individually to show 24 and 10 have a sum of 34 may be necessary for some students. Continue to show various ways of counting and have students consider ways that might be more efficient than others.

Example 1a 24 + 10
Side-by-Side Comparison: Base-10 Blocks with or without the Mat, Place Value Chart (and Drawing)

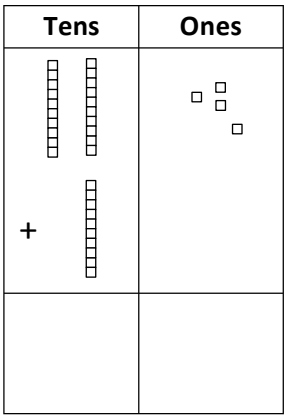
Teacher: "Let's build 24. How can we build the number 24?"
Lead students through a discussion about how we can show the number 24.

Teacher: "Ok. Now, let's add 10."
As you model the addition with the Base-10 Blocks, record what is happening in the Base-10 Chart. It may be helpful to use the Place-Value Chart along with the Base-10 Blocks and show how to write the numbers on the Place-Value Chart as well.

Base-10 Blocks



Base-10 Blocks with Mat

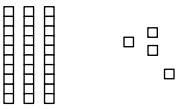


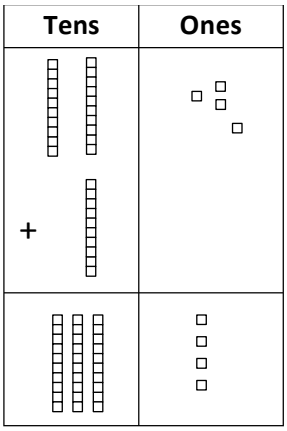
Place-Value Chart

Tens	Ones
2 + 1	4

Traditional

24
+ 10





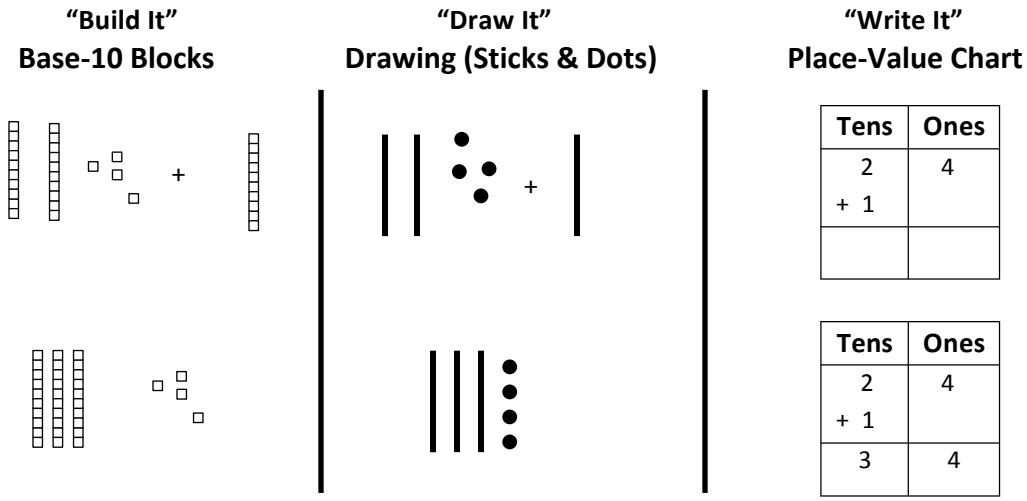
Tens	Ones
2 + 1	4
3	4

24
+ 10
34

Teacher: "What do you notice about the Base-10 Blocks?"
Students might notice that you have four Ten sticks (they each have a value of ten – if needed students line up ten ones to show that they are the same).

Teacher: "Can we group any of these Base-10 Blocks together?"
We can organize the Base-10 Blocks so that all the tens units are together and then the ones.
Teacher: "how much do we have altogether?" [34]

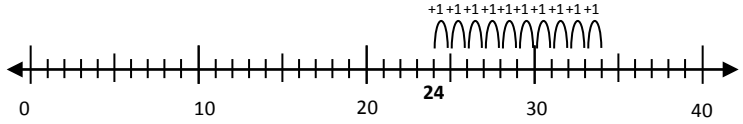
Side-by-Side Comparison: Drawing Method (Students record with drawing "Sticks" and "Dots")
As you continue to facilitate students understanding of place value using a variety of multiple methods, you might have students physically building with Base-10 Blocks and recording by drawing sticks and dots. The "sticks" represent 10's and the "dots" represent ones.
Below is the same example and what the work might look like:



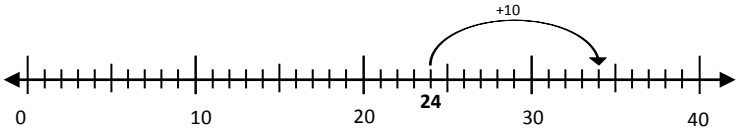
Side-by-Side Comparison: Number Line Method
Additionally, the number line can show that students have various ways of counting. Jumping a unit of ten on a number line will be a more complex task than the previous method of using Ten-Frame cards and Base-10 Blocks. The Number Line does not show the emphasis on groups of ten and how place values change or remain the same when adding multiples of ten to a number. Discussing how the methods are similar will be helpful in providing students to gain a deeper understanding of the relationship of 10 (adding or subtracting 10) and how it can be demonstrated using various models.

Prior experiences adding on a number line may benefit the effectiveness of this part of the lesson. Consider your students' experiences and learning needs as you work with the number line. You may wish to provide students with pre-drawn number lines that are slipped into sheet protectors. Students will just need to label the numbers on the number line.

Example 1a 24 + 10
Side-by-Side Comparison: Number Line
Teacher: "How can we add these numbers using a number line?"
Student responses will most likely include starting on 24 and counting on by ones. Start at 24, and then count 25, 26, 27, 28, 29, 30, 31, 32, 33, 34.



Seeing how to jump 10 on a number line will be challenging at first. Connect the idea to previous methods shown – Ten-Frame cards and Base-Ten Charts – to allow students to a direct comparison.



A note about Decomposition:
When leading the class discussion, other methods might surface as students explain their thinking. Decomposing numbers and using "friendly" numbers is a common strategy that students will use for these types of problems.
Consider the following:

24 + 10
= 24 + 6 + 4
= 30 + 4
= 34

Students may look for a way to get from 24 to the next friendly number (next group of ten). In this case that number is 30. You need 6 to get from 24 to 30. Then you decompose 10 into 6 and 4. Add 24 + 6, and then add 4.

Another take on Decomposition:

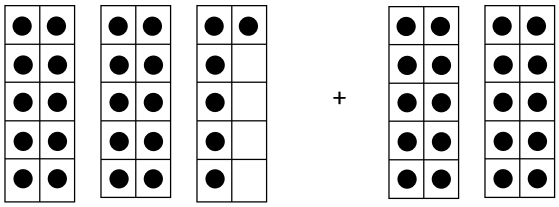
24 + 10
= 20 + 4 + 10
= 20 + 10 + 4
= 30 + 4
= 34

In this method of decomposition, students are decomposing by place value – tens and ones. This may help students see connections to what is happening in the other models of addition. However, remember that just because students can say the place values or write the place values, does not mean that they have a complete understanding of the number and its flexibility as a unit of ten (i.e. Ten units of one vs. one unit of ten)

Example 1b. 24 + 20

Side-by-Side Comparison: Ten-Frames & Place Value (with Traditional)

Ten Frames



Place-Value Chart

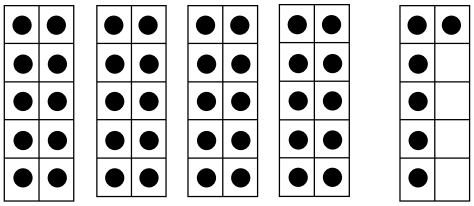
Tens	Ones
2 + 2	4

Traditional

24
+ 20

Continue with the same questions and format as before.

Ten Frames



Place-Value Chart

Tens	Ones
2 + 2	4
4	4

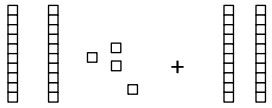
Traditional

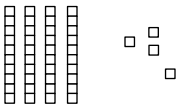
24
+ 10
44

Example 1b. 24 + 20

Side-by-Side Comparison: Base-10 Blocks with or without the Mat, Place Value Chart (and Drawing)

Base-10 Blocks





Base-10 Blocks with Mat

Tens	Ones
+	

Tens	Ones
+	

Place-Value Chart

Tens	Ones
2 + 2	4

Tens	Ones
2 + 2	4
4	4

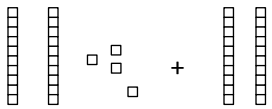
Traditional

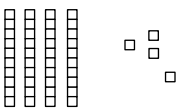
24
+ 20

24
+ 20
44

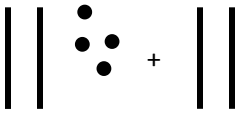
Side-by-Side Comparison: Drawing Method (Students record with drawing "Sticks" and "Dots")

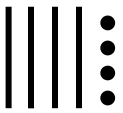
"Build It"
Base-10 Blocks





"Draw It"
Drawing (Sticks & Dots)





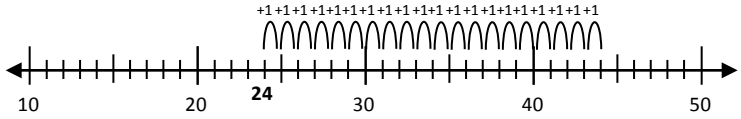
"Write It"
Place-Value Chart

Tens	Ones
2 + 2	4

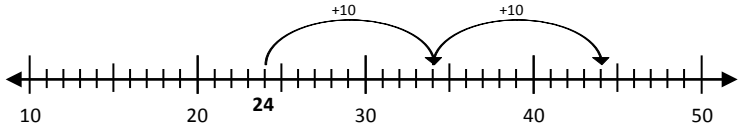
Tens	Ones
2 + 2	4
4	4

Example 1b 24 + 20
Side-by-Side Comparison: Number Line

Adding by Ones



Adding by Tens

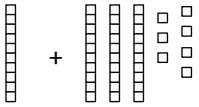
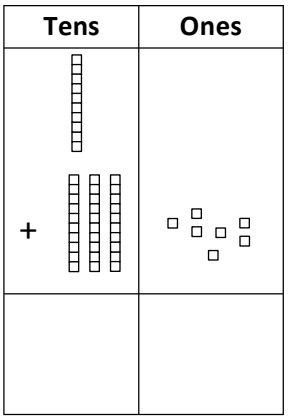
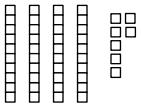
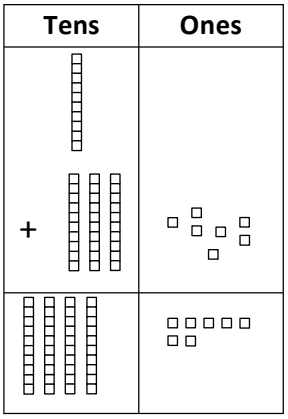
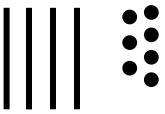


Continue to model adding various multiples of ten to the same first addend can create an opportunity to discuss patterns in what students notice about the changes to the addends versus the sums.

Additional Examples or Your Tries
24 + 30
24 + 40
24 + 50
etc...

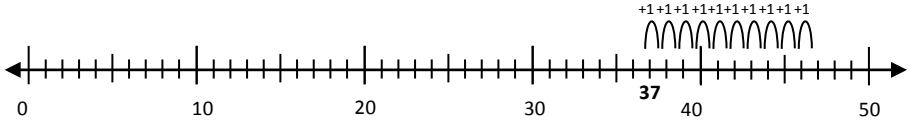
Example 2 10 + 37

Showing the addends with the multiple of ten first is important. Students need to recognize that you can add amounts of tens when it is the first addend or second addend.

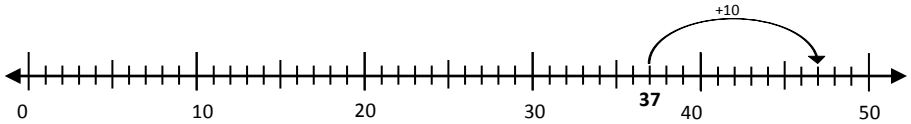
Base-10 Blocks	Base-10 Blocks with Mat	Drawing	Place-Value Chart	Traditional
			Tens: 1, + 3 / Ones: 7	10 + 37
			Tens: 1, + 3, 4 / Ones: 7, 7	10 + 37 47

Number Line

Adding by Ones



Adding by Tens



*Note: Additional Number Line strategies can be modeled, however, these strategies may be better paired with decomposition or strategies emphasizing friendly numbers.

Additional Examples and You Tries

20 + 37

30 + 37

40 + 37

What would happen if you added 60 and 37? Which place value would stay the same? Which would change? How do you know?

Further Examples & You Tries
Students will need further practice over a few days or weeks with this concept. Continue to vary the problems students are given and the amounts of tens being added.

Questions to be asked during the lessons:

- What patterns do you notice?
- What stays the same?
- What is different? Why?
- If we count by ones and count by tens to get to the sum, will the answer be the same?
- What counting strategies are most efficient?
- How does "counting by tens" helping add with multiples of ten?

Grade 2 Understanding of Place Value
In Grade 2, students will continue to gain fluency in skills related to place value, and having a sense of base 10. Students continue to work on addition and subtraction using a variety of methods.

Check out the following Grade 2 standards:

Use place value understanding and properties of operations to add and subtract.
2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900

Additional Activity: Who Am I?
In this activity, use clues to have students guess your number. Clues can be given orally or in written form. In the beginning, students can use base-ten blocks or other models to help them solve the problems. As you continue using this routine, you can change the difficulty of the problems and eventually, have students write their own riddles.

Clues can include addition and subtraction of groups of tens. Here are some suggestions of clues:

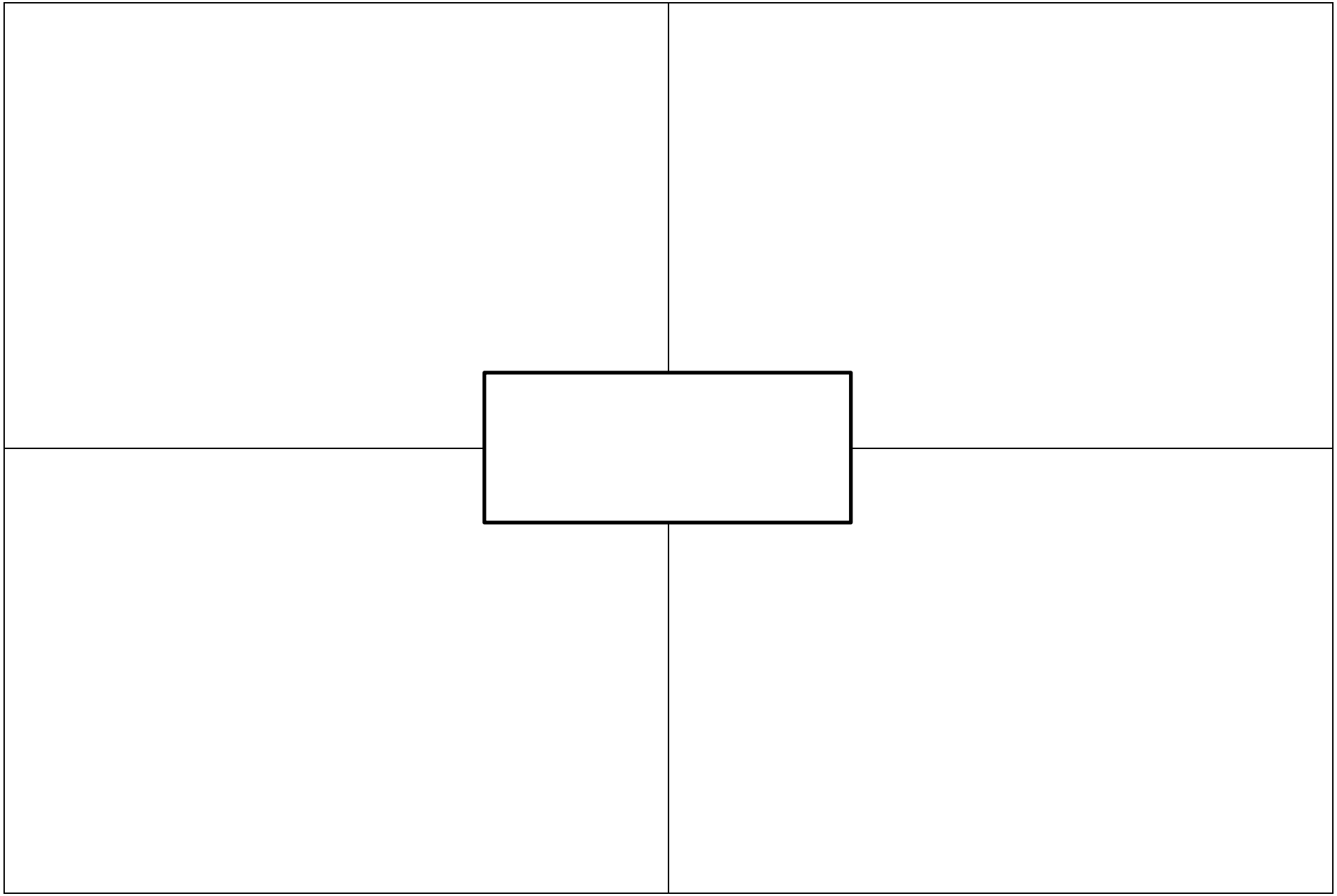
- I have 32 ones and 5 tens. Who am I?
- I have 47 ones and 2 tens. Who am I?
- I have 60 ones and 4 hundreds. Who am I?
- I am the number that is 5 tens less than 91. Who am I?
- If you put 3 more tens with me, I would be 78. Who am I?
- I have 13 ones. I am between 70 and 80. Who am I? How many tens do I have?

Assessment:

Have students show at least 2 ways to add 28 + 30. You can have students use the multiple methods mat or use binder paper.

Base-10 Blocks/ Drawing

Place Value

Ten Frames

Number Line